Software Construction & Development

"Lab 05"

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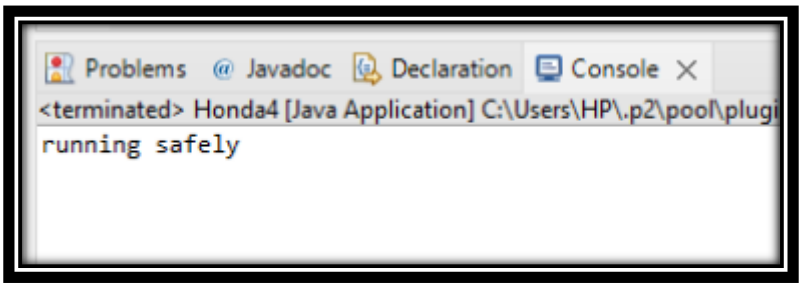
Section : V-A

1. **Java Example :**

```
1  package lab5;
2  abstract class Bike{
3   abstract void run();
4  }
5   class Honda4 extends Bike{
6  void run()
7   {
8       System.out.println("running safely");
9  }
10 public static void main(String args[])
11  {
12  Bike obj = new Honda4();
13  obj.run();
14  }
15 }
```

OUTPUT:



2. Java Example:

Honda4.java | TestAbstraction1.java

```
1  package lab5;
2
3  abstract class Shape{
4      abstract void draw();
5   }
6
7  class Rectangle extends Shape{
8  void draw()
9  {
10     System.out.println("drawing rectangle");
11 }
12 }
13 class Circle1 extends Shape
14 {
15  void draw(){System.out.println("drawing circle");}
16 }
17  class TestAbstraction1{
18 public static void main(String args[]){
19  Shape s=new Circle1();
20  s.draw();
21 } }
22
23
```

OUTPUT:

Problems | Javadoc | Declaration | Console

<terminated> TestAbstraction1 [Java Application] C:\Users\HP\.p2\pool\plugins\org.

```
drawing circle
```

3. Java Example :

Honda4.java | TestAbstraction1.java | TestBank.java

```
1  package lab5;
2  abstract  class Bank{
3      abstract int getRateofInterest();
4  }
5  class SBI extends Bank{
6      int getRateofInterest()
7      {
8          return 7;
9      }
10 }
11 class PNB extends Bank{
12     int getRateofInterest()
13     {
14         return 8;
15     }
16 }
17 public class TestBank {
18
19     public static void main(String[] args) {
20         // TODO Auto-generated method stub
21         Bank b1=new SBI();
22         Bank b2=new PNB();
23         System.out.println("Rate of interest of SBI = "+b1.getRateofInterest());
24         System.out.println("Rate of interest of PNB = "+b2.getRateofInterest());
25     }
26
27 }
28
```

OUTPUT:

Problems | Javadoc | Declaration | Console

```
<terminated> TestBank [Java Application] C:\Users\HP\.p2\pool\plu
Rate of interest of SBI = 7
Rate of interest of PNB = 8
```

4. Java Example :

```java
package lab5;
abstract class Bike1{
    Bike1(){
        System.out.println("Bike is created");
    }
    abstract void run();
    void changeGear()
    {
        System.out.println("Gear changed");
    }
}
class Honda extends Bike1{
    void run() {
        System.out.println("Running successfully");
    }
}
public class TestAbstraction2 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        Bike1 b=new Honda();
        b.run();
        b.changeGear();
    }

}
```

OUTPUT:

```
Problems  Javadoc  Declaration  Console
<terminated> TestAbstraction2 [Java Application] C:\Users\HP\.p2\pool\plug
Bike is created
Running successfully
Gear changed
```

5. Java Interface Example :

A6.java | Honda4.java | TestAbstraction1.java

```
1  package lab5;
2
3  interface printable{
4      void print();
5  }
6  class A6 implements printable{
7      public void print()
8      {
9          System.out.println("Hello");
10     }
11 public static void main(String args[]){
12     A6 obj = new A6();
13     obj.print();
14 }
15 }
```

OUTPUT:

Problems | Javadoc | Declaration | Console

<terminated> A6 [Java Application] C:\Users\HP\.p2\pool\plugins\o

```
Hello
```

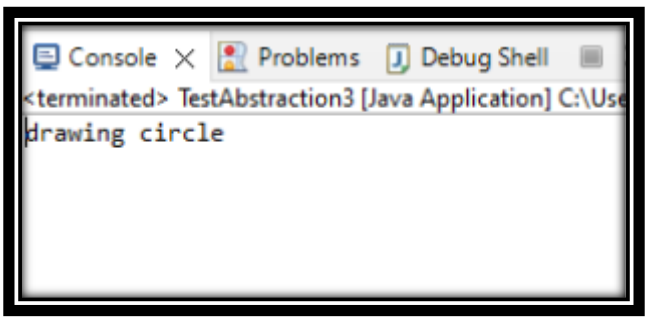
6. Java Interface Example :

```java
package lab5;

interface Drawable{
void draw();
}

class Rectangle1 implements Drawable{
 public void draw()
 {
      System.out.println("drawing rectangle");
 }
class Circle2 implements Drawable{
 public void draw()
 {
      System.out.println("drawing circle");
      }
}
class TestAbstraction3{
 public static void main(String args[]){
 Drawable d=new Circle2();
 d.draw();
 }}
```

OUTPUT:



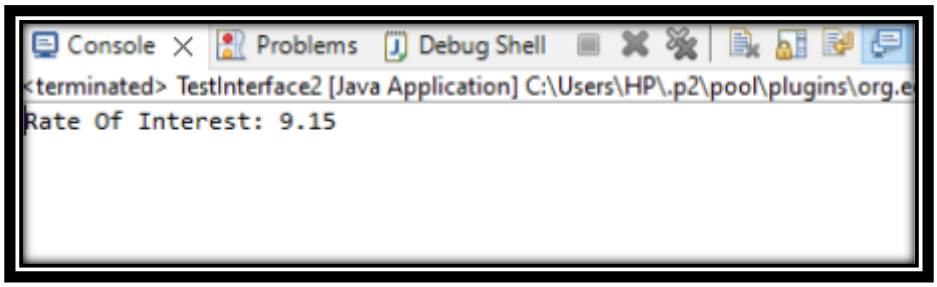
7. Java Interface Example :

```java
package lab5;

interface Bank1{
 float rateOfInterest();
}

class SBI1 implements Bank1{
 public float rateOfInterest()
 {return 9.15f;}
}
 class PNB1 implements Bank1{
 public float rateOfInterest()
 {return 9.7f;} }
 class TestInterface2{
 public static void main(String[] args){
 Bank1 b=new SBI1();
 System.out.println("Rate Of Interest: "+b.rateOfInterest());
 }}
```

OUTPUT:

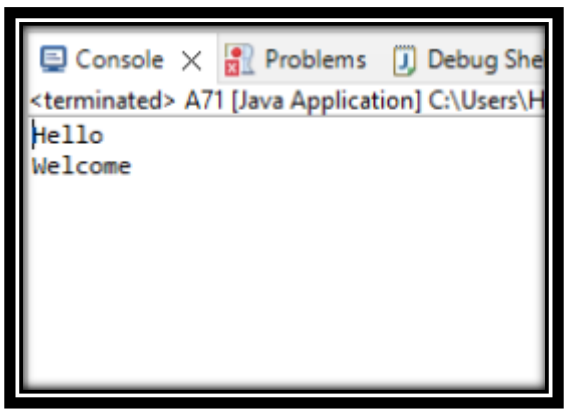


8. Java Interface Example :

```java
package lab5;
interface Printable1{
 void print();
}
interface Showable2{
void show();
}
class A71 implements Printable1,Showable2{
public void print()
{System.out.println("Hello");}
 public void show()
 {System.out.println("Welcome");
 }

 public static void main(String args[]){
 A71 obj = new A71();
 obj.print();
 obj.show();
 }
}
```

OUTPUT:



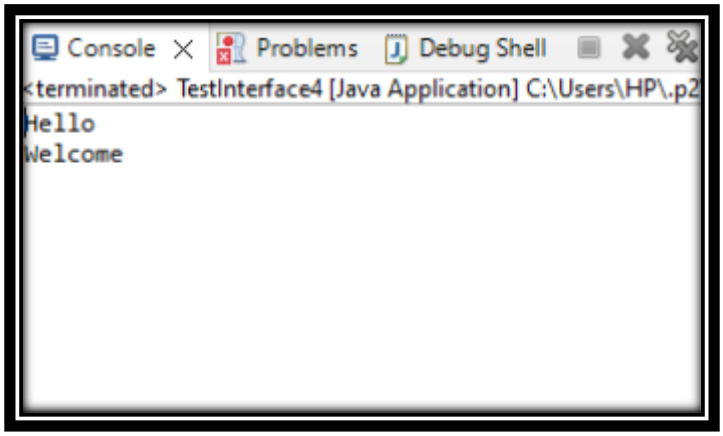
9. Interface Inheritance Example :

```java
package lab5;

interface Printable2{
 void print();
}
interface Showable3 extends Printable2{
 void show();
 }
class TestInterface4 implements Showable3{
 public void print()
 {
     System.out.println("Hello");
 }
public void show()
{
    System.out.println("Welcome");
}

public static void main(String args[]){
 TestInterface4 obj = new TestInterface4();
 obj.print();
 obj.show();
 }
}
```

OUTPUT:

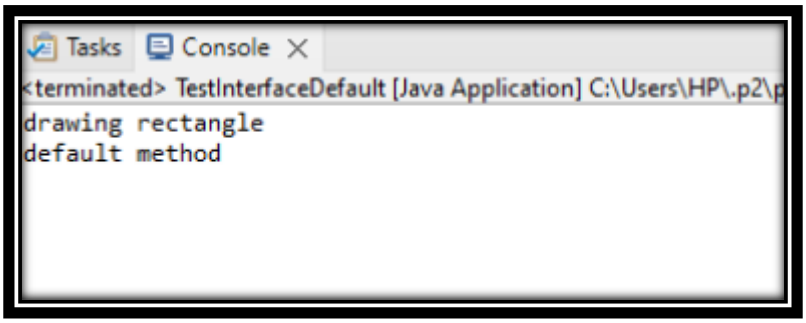


10. Default Method Example:

```java
package lab5;

interface Drawable2{
void draw();
 default void msg()
 {
     System.out.println("default method");}
 }
class Rectangle3 implements Drawable2{
 public void draw(){System.out.println("drawing rectangle");}
}
 class TestInterfaceDefault{
public static void main(String args[]){
 Drawable2 d=new Rectangle3();
 d.draw();
 d.msg();
 }}
```

OUTPUT:

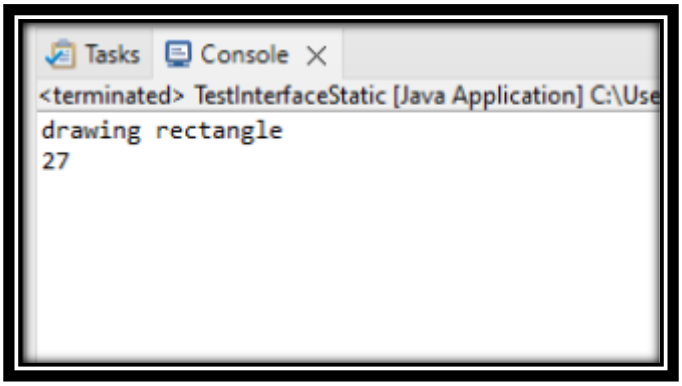


11. Static Method In Interface Example:

```java
package lab5;
interface Drawable4{
 void draw();
 static int cube(int x)
 {
     return x*x*x;
 }
}

 class Rectangle4 implements Drawable4{
public void draw()
 {
     System.out.println("drawing rectangle");}
 }
 class TestInterfaceStatic{
public static void main(String args[]){
Drawable4 d=new Rectangle4();
d.draw();
System.out.println(Drawable4.cube(3));
}}
```

OUTPUT:



12. Java Package Example :

B.java A.java

```java
package pack;

public class A {
        public void msg()
        {
            System.out.println("Hello");
        }
    }
```

B.java A.java

```
1  package mypack;
2  import pack.*;
3  public class B {
4
5      public static void main(String[] args) {
6          // TODO Auto-generated method stub
7  A obj=new A();
8  obj.msg();
9      }
10
11 }
12
```

OUTPUT:

Problems Javadoc Declaration Console

<terminated> B [Java Application] C:\Users\HP\.p2\pool\plugin

```
Hello
```

13. Encapsulation Example:

B.java A.java Student.java Test.java

```
1
2   package com.javatpoint;
3  public class Student{
4   //private data member
5      private String name;
6
7   public String getName(){
8   return name;
9   }
10  //setter method for name
11  public void setName(String name){
12  this.name=name;
13  } }
```

```java
public class Test {
    public static void main(String[] args){
        Student s=new Student();
        s.setName("TANZEELA ASGHAR");
        system.out.println(s.getName());
    }
}
```

OUTPUT:

```
C:\Users\92313\.jdks\openjdk-21\bin\java.exe "-jav
 .jar=50381:C:\Program Files\JetBrains\IntelliJ ID
 .encoding=UTF-8 -classpath C:\Users\92313\Desktop
TANZEELA ASGHAR

Process finished with exit code 0
```

14. Encapsulation Example :

```java
package lab_5p;
class Account{
    private long acc_no;
    private String name,email;
    private float amount;
    public long getAcc_no() {
    return acc_no;
    }
    public void setAcc_no(long acc_no) {
    this.acc_no = acc_no;
    }
    public String getName() {
    return name;
    }
    public void setName(String name) {
    this.name = name;
    }
    public String getEmail() {
    return email;
    }
    public void setEmail(String email) {
    this.email = email;
    }
     public float getAmount()
     {
     return amount;
    }
         public void setAmount(float amount) {
         this.amount = amount;
    }
         }
```

```java
package lab_5p;
public class TestAccount {
public static void main(String[] args) {
  Account acc=new Account();
  acc.setAcc_no(061);
  acc.setName("SABA TARIQ");
  acc.setEmail("sabatariq050.com");
  acc.setAmount(250000);
  //getting values through getter methods
  System.out.println("Account no. = "+acc.getAcc_no()+" \nName = "+acc.getName()+" \nEmail = "+
  acc.getEmail()+" \nAmount = "+acc.getAmount());
  }
  }
```

OUTPUT:

```
Run  Test
 .jar=50401:C:\Program Files\JetBrains\IntelliJ IDEA Commu
 .encoding=UTF-8 -classpath C:\Users\92313\Desktop\lab_05\
ACCOUNT NO. = 32
NAME=TANZEELA ASGHAR
EMAIL = tanzeelaasghar@gmail.com
AMOUNT=30,000.0
```